Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

(DRAFT)
Conditional Major, Construction / Operating
Permit: F-08-030
Kentucky Energy Hub
Mortons Gap, KY 42440
October 8, 2008
Julian D. Breckenridge, Reviewer

SOURCE ID:	21-107-00159
AGENCY INTEREST:	82821
ACTIVITY:	APE20080002

SOURCE DESCRIPTION:

Orbit Gas Storage, Inc. (OGS) is seeking to construct and operate a natural gas compressor station called Kentucky Energy Hub (the Project) in Hopkins County, Kentucky. OGS is proposing to convert the existing depleted White Plains Gas Field and connect its pipeline header to the interstate pipeline grid. The White Plains Gas Storage Field is located in the southern part of Hopkins County, near the intersection of the Pennyrile Parkway and the Western Kentucky Parkway at approximately six miles southeast of the City of Madisonville. The Project will contain approximately 5 billion cubic feet of working capacity and up to 100 million standard cubic feet per day (mmscf/d) of injection and withdrawal capacity. It will also consist of the installation of 10 new horizontal injection/ withdrawal wells on three well pads and a field header system sufficient to support the injection and withdrawal of gas supplies at the new storage facility. The proposed 8.6-mile-long x 16-inch-diameter field header pipeline will connect the storage field to the proposed compressor station. To the west of the compressor station, the 24-inch-diameter OGS Pipeline will continue for approximately 13.3 miles to an interconnect with the existing ANR Pipeline Company (ANR) pipeline system near Rabbit Ridge, Kentucky.

The compressor station will include three (3) reciprocating compressor units each driven by identical Caterpillar G3606 natural gas-fired internal combustion engines rated at 1,775 brake horsepower (bhp). Each engine will be equipped with an integral silencer/ oxidation catalyst to minimize emissions of carbon monoxide (CO) and hydrocarbons such as formaldehyde. The facility will also have a 250-kilowatt auxiliary generator using a natural gas-fired reciprocating engine. The auxiliary unit will only be operated intermittently for testing, but permitted to operate for up to 500 hours per year. Finally, a glycol gas dehydrator and glycol regenerator heater will be used to remove water vapor from the natural gas prior to transport.

On May 15, 2008 the Division for Air Quality (Division) received a permit application from OGS for the proposed operation of the Project scheduled for April 2009. The application was for the construction/operating authority of a major source to be processed under 401 KAR 52:020. After reviewing and completing the application on September 24, 2008, the source decided to become a minor source with a conditional major permit of federally enforceable limits under 401 KAR 52:030. The source will have maximum uncontrolled emissions of approximately 129 tons per year of carbon monoxide (CO). With the oxidation catalysts on the compressor engines, the source will be able to achieve CO limits below major source thresholds. Even though potential emissions for volatile organic compounds (VOC) and single hazardous air pollutants (HAP) will be below major source

thresholds, the source also requested federally enforceable limits for VOC and single and combined HAPs.

COMMENTS:

Emission Units:

Table 1. Summary of all emission points, descriptions, and rated capacities

EMISSION POINTS	DESCRIPTION	MAXIMUM OPERATING RATE
EP-1	**ENGINE 1** **Caterpillar G3606 IC Engine** 4-cycle lean burn reciprocating w/ 1,775 bhp Primary Fuel: Natural Gas Installation Date: 2009 Stack: S-1 Control Device: Oxidation Catalyst	11,200 scf/hr
EP-2	**ENGINE 2** **Caterpillar G3606 IC Engine** 4-cycle lean burn reciprocating w/ 1,775 bhp Primary Fuel: Natural Gas Installation Date: 2009 Stack: S-2 Control Device: Oxidation Catalyst	11,200 scf/hr
EP-3	**ENGINE 3** **Caterpillar G3606 IC Engine** 4-cycle lean burn reciprocating w/ 1,775 bhp Primary Fuel: Natural Gas Installation Date: 2009 Stack: S-3 Control Device: Oxidation Catalyst	11,200 scf/hr
EP-4	**Glycol Dehydrator/ Reboiler** **Model 54/600M/7** Primary Fuel for Reboiler: Natural Gas Installation Date: 2009 Stack: S-4 Control Device: Thermal Oxidizer	4.17 mmscf/hr

Table 2. Control devices and control efficiencies at the emission points

EMISSION POINTS	STACKS	CONTROL DEVICES	CONTROL EFFICIENCY
EP-1	S1	OX1 – Oxidation Catalyst	93% (CO Removal) 94% (Formaldehyde Removal)
EP-2	S2	OX2 – Oxidation Catalyst	93% (CO Removal) 94% (Formaldehyde Removal)
EP-3	S3	OX3 – Oxidation Catalyst	93% (CO Removal) 94% (Formaldehyde Removal)
EP-4	S4	TO1 – Thermal Oxidizer	99% (VOC and BTEX Removal)

***Note: BTEX (Benzene, toluene, ethylbenzene, and xylene emissions)**

a) Potential to Emit Calculations

Emission factors for the compressor engines were from AP-42 and those supplied by the manufacturer. The source used the GRI – GLYCalc Version 4.0 software to calculate the emissions from the glycol dehydrator.

b) Applicable Regulations

40 CFR 63 Subpart ZZZZ, *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*. Subpart ZZZZ applies to stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAPs and pursuant to 40 CFR 63.6590 (a)(2)(iii), a stationary RICE located at an area source of HAP emissions that commences construction on or after June 12, 2006 is considered a new stationary RICE for the purposes of Subpart ZZZZ. Three identical 4-cycle lean-burn stationary RICE rated each at 1775 bhp at emission points EP-1, EP-2 and EP-3 will be installed at KY Energy Hub in 2009, and therefore, Subpart ZZZZ applies.

40 CFR 63 Subpart HH, *National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities*. Pursuant to 40 CFR 63.760 (b) and 63.671 Subpart HH applies to facilities that are major or area sources for HAPs; and that process, upgrade, or store hydrocarbon liquids prior to the point of custody transfer; or that process, upgrade, or store hydrocarbon liquids prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user. KY Energy Hub will be an area source of HAP emissions, which processes natural gas in a glycol dehydrator (EP-4) prior to the point of custody transfer.

c) Non-applicable Regulations

401 KAR 59:015, New indirect heat exchangers is not applicable to the reboiler because it has a heat input capacity less than 1 mmBTU/hr.

40 CFR 60 Subpart JJJJ, *Stationary Spark Ignition Internal Combustion Engines*. Subpart JJJJ does not apply to KY Energy Hub because each engine is greater than 1,350 bhp.

40 CFR 63 Subpart HHH, *National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities*. Pursuant to 40 CFR 63.1270, Subpart HHH applies to natural gas transmission and storage facilities that are major sources of HAPs. OGS has applied to operate KY Energy Hub as a minor source with a conditional major permit of federally enforceable limits under 401 KAR 52:030; therefore, the requirements of this subpart will not apply to the facility.

State-Origin Requirements:

401 KAR 63:020, *Potentially hazardous matter or toxic substances*, applies to each affected facility which emits or may emit potentially hazardous matter or toxic substances, provided that such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division for Air Quality. 401 KAR 63:020 does not apply to KY Energy Hub because the emissions are subject to 40 CFR 63 Subpart HH and ZZZZ.

EMISSION AND OPERATING CAPS DESCRIPTION:

OGS has applied to operate KY Energy Hub under federally enforceable permit limits of less than 90 tons per year each of CO and VOC, less than 9 tons per year of any single HAP and less than 22.5 tons per year of combined HAPs.

PERIODIC MONITORING: None

OPERATIONAL FLEXIBILITY:

The source is not restricted as to hours of operation or quantity of product produced, while remaining within the caps above.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.